

U.S. Patent Application No. 10/795,968
Amendment dated April 30, 2007
Reply to Office Action of October 30, 2006

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REMARKS/ARGUMENTS

Reconsideration and continued examination of the above-identified application are respectfully requested.

By way of this amendment, claim 65 has been added, which has the same language as claim 36, but recites a formation voltage of 35 Vf, which is fully supported in the present application at page 9, lines 8-20. Accordingly, no questions of new matter should arise and entry of this amendment is respectfully requested.

Rejection under 35 U.S.C. §112, first paragraph

At page 3 of the Office Action, the Examiner rejects claims 36-64 under 35 U.S.C. §112, first paragraph, for written description reasons. The Examiner asserts that the formation voltage of 20 volts and the sintering temperature of 1100° C are not supported by the specification. The Examiner further asserts that in claim 42, the DC leakage of from about 0.5 nA/CV to less than 5.0 nA/CV is not supported in the specification. This rejection is respectfully traversed.

Under 35 U.S.C. §112, first paragraph, the written description requirement is satisfied when the specification provides a sufficient description so that the subject matter claimed is reasonably conveyed to one skilled in the art at the time the invention was filed to show that the inventors had possession of the claimed invention.

With respect to claim 36, besides the examples referred to by the Examiner, the specification clearly discloses, for instance, beginning at page 9, that the present invention relates to niobium powder, which when formed into an electrical capacitor anode, has capacitance of above 62,000 CV/g, as well as above 70,000 CV/g. Other CV/g ranges are recited. Further, at page 9, beginning at line 11 of the present application, the specific starting capacitance of about 65,000

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CV/g is disclosed. Furthermore, at page 9, beginning at line 13, the present application teaches that the capacitance is measured "in the following way." The present application then proceeds to state, beginning at page 9, line 15, that the niobium powder can be measured for capacitance using sintering temperatures from 1000° C to 1500° C and specifically provides a temperature of 1100° C at page 9, line 19. Furthermore, at page 9, lines 19-20, the formation voltage of 20 volts is specifically disclosed. Furthermore, at page 10, lines 12-14, the DC leakage of from about 5.0 nA/CV to about 0.50 nA/CV is specifically disclosed with respect to anodes formed from the niobium powders of the present invention, and this whole paragraph is a reference to the niobium powders of the present invention. Accordingly, the present application specifically provides a written description of the various parameters set forth in claims 36 and 42 to clearly satisfy the written description requirement. Accordingly, this rejection should be withdrawn.

Rejection of claims 36-43, 50-56, and 58-61 under 35 U.S.C. §102(b) and §103(a) -- Chang

At page 5 of the Office Action, the Examiner rejects claims 36-43, 50-56, and 58-61 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being unpatentable over Chang (U.S. Patent No. 5,448,447). The Examiner relies upon the rejection set forth in the September 25, 2005 Office Action. The Examiner further relies on one particular sentence in Chang, which allegedly states that the chemical and physical properties of tantalum and niobium are known by those skilled in the art to be sufficiently similar to permit substitution of either metal. The Examiner does admit that Chang does not recite any examples using niobium, but still alleges that the substitution of niobium for tantalum would be obvious. Further, the Examiner asserts that the particular test conditions used to determine capacitance in claim 36 are process limitations.

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Finally, at page 10 of the Office Action, the Examiner asserts that the §1.132 Declaration submitted previously does not address the difference between applied formation voltage of the 35 volts and the limitation for applied voltage as amended in instant claim 36 (20 volts). This rejection is respectfully traversed.

Claim 36 of the present application recites a niobium powder, which is characterized by sintering the niobium powder at a temperature of 1100° C for 10 minutes and anodized using a formation voltage of 20 Vf at 60° C, and which has a capacitance of at least 65,000 CV/g and a DC leakage of less than 5.0 nA/CV. The remaining claims (except new claim 65) are directly or indirectly dependent on claim 36.

In the Office Action, the Examiner asserts that the limitations of claims 36-42, 48, and 49 are directed to process limitations and are not given weight to the claims. The applicants respectfully disagree with the Examiner's assertion that the limitations set forth in the claims, including claim 36, are "process limitations." The Examiner further states that the patentability does not depend on the method of production, but rather the product itself. The applicants believe that the Examiner is misunderstanding the limitations set forth in claim 36. Claim 36 recites electrical characteristics of the powder, and in order to recite electrical characteristics of a powder, one needs to provide a test in order to determine the electrical characteristics of the powder. Thus, the particular limitations set forth in claim 1 are not process limitations, but rather test conditions so that the electrical characteristics of the niobium powder recited in claim 36 can be more clearly presented.

With respect to the §102(b) rejection of the claims, as the Examiner recognizes, Chang does not recite any examples whatsoever of niobium. Chang does not provide chemical characteristics, and does not provide any physical characteristics, and most importantly, does not provide any

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electrical characteristics of the niobium powder. Since Chang does not specifically teach any niobium having any characteristics, it is unclear how the claims could be rejected under 35 U.S.C. §102(b) since, under such a rejection, Chang must teach literally or inherently each and every limitation set forth in the claims, and without Chang even disclosing any niobium powder or niobium characteristics, the §102(b) should be withdrawn. The particular sentence referred to by the Examiner is an insufficient sentence to provide a specific teaching of the niobium powder recited in claim 36.

Furthermore, with respect to the particular sentence referred to by the Examiner in Chang, it is respectfully noted that Chang does not state that the niobium electrical characteristics are the same as the tantalum electrical characteristics and, further, Chang does not state that tantalum electrical characteristics can be substituted as equivalent to niobium electrical characteristics. It is interesting to note that Chang refers to chemical and physical properties, but not electrical characteristics of the powders. Furthermore, nothing in Chang supports the Examiner's position in this rejection with respect to niobium powder having the same electrical characteristics as the tantalum powder recited in Chang.

Moreover, the previous Declaration filed with the response on February 24, 2006, incorporated in its entirety by reference herein, further shows that the Examiner's substitution argument would not have merit irrespective of the Examiner's comments regarding data for a 20 volt formation. Clearly, the Declaration evidence filed February 24, 2006 shows that even if one was capable of using the particular chemical and physical characteristics of tantalum in a niobium powder, one would not achieve the particular niobium powder recited in the claims as shown by the significant difference in electrical properties. This evidence clearly shows that the Examiner's assumption that niobium powder can be substituted for tantalum powder would not provide the type

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of niobium powder set forth in the claims of the present application with respect to electrical properties.

Therefore, the applicants respectfully traverse the Examiner's position with respect to niobium powder being a substitute for tantalum powder, especially with respect to electrical properties and further disagree with the Examiner's position that Chang would permit one to make such a substitution and achieve the particular niobium powder set forth in the claims.

In addition, the applicants provide a copy of a Declaration submitted in an earlier-filed application of the same assignee, which further discusses why niobium is not a substitute for tantalum. Furthermore, the applicants note that if the substitution of niobium for tantalum was made, as proposed by the Examiner, niobium powder would have been used commercially as a substitute for tantalum anodes some time ago. However, the first commercial niobium anode made with niobium powder was only recently introduced commercially, well after the §120 filing date of the present application.

Also, submitted with this response is a second Declaration by Heather Enman, which shows through extrapolation and additional data that even if the Examiner's proposed substitution was proper, the niobium powder having the BET surface area of Chang and tested at electrical formation conditions of 20 volts and a sinter temperature of 1100° C would still lead to a niobium powder having a capacitance of less than 65,000 CV/g. This further evidence confirms the previous arguments provided by applicants on this issue.

In addition, in the Declaration submitted by Heather Enman, which is attached, it is further pointed out that if the Examiner's substitution argument is correct, then one skilled in the art should be able to take the tantalum powder of Chang, and using the electrical conditions set forth in claim 36, obtain the electrical properties set forth in claim 36. In other words, if one takes the tantalum

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powder used in Chang and tests for electrical properties by sintering at a temperature of 1100° C for 10 minutes and anodized using a formation voltage of 20 Vf at 60° C, according to the Examiner's substitution argument, one would achieve a capacitance of at least 65,000 CV/g and a DC leakage of less than 5.0 nA/CV. However, as shown in the attached Declaration, tantalum powder, having a BET of less than 0.6 m²/g, would be essentially incapable of forming any capacitance near 65,000 CV/g, since it is such a low sintering temperature, the tantalum powder of Chang would be incapable of forming an anode to obtain capacitance and the DC leakage would be well above 5 nA/CV. This further shows the inability to make the substitution alleged and proposed by the Examiner.

In addition, the applicants note that the anodizing formation voltages of the tantalum powder set forth in Chang are 100 volts or higher.

Finally, new claim 65 recites the same subject matter as claim 36, except using a formation voltage of 35 volts. This claim would be patentable for the same reasons.

For these reasons and the reasons previously of record, this rejection should be withdrawn.

Rejection of claims 48, 49, 52, 57, and 62-64 under 35 U.S.C. §103(a) – Chang

At page 6 of the Office Action, the Examiner then rejects claims 48, 49, 52, 57, and 62-64 under 35 U.S.C. §103(a) as being unpatentable over Chang, essentially for the same reasons as applied above in rejecting claim 36. The Examiner asserts that with respect to claims 48 and 49, Chang teaches the oxygen content recited in the claims. This rejection is respectfully traversed.

For the reasons set forth above, this rejection should also be withdrawn. To avoid repeating the same arguments, the applicants rely upon the evidence and comments set forth above. It is noted that these claims are dependent ultimately on claim 36 and, therefore, recite a niobium

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powder having certain electrical characteristics in addition to the various limitations set forth in the rejected dependent claims. As stated, Chang does not teach or even suggest a niobium powder having the characteristics set forth in the claims, and the Examiner's proposed substitution argument regarding tantalum and niobium has been shown not to be a valid argument. Accordingly, this rejection should be withdrawn.

Rejection of claims 36-47 and 49-64 under 35 U.S.C. §103(a) – WO 98/37248 in view of Chang

At the bottom of page 6 of the Office Action, the Examiner rejects claims 36-47 and 49-64 under 35 U.S.C. §103(a) as being unpatentable over WO 98/37248 in view of Chang. The Examiner essentially relies on Chang for the reasons set forth above. The Examiner asserts that WO '248 shows tantalum powder having a particular capacitance. The Examiner does acknowledge that WO '248 does not teach or suggest that the powder is niobium, but the Examiner asserts that it would be obvious to use niobium in the sintered anodized powder electrodes disclosed by WO '248. This rejection is respectfully traversed.

The comments regarding Chang above apply equally here to this rejection. WO '248 strictly relates to tantalum and makes absolutely no suggestion regarding niobium powder. All of the data, all of the examples, all of the test methods, and the electrical properties only relate to tantalum powder and not niobium powder. The Examiner has essentially taken the position that it would be obvious to take these electrical properties for a completely different powder and routinely obtain these properties for niobium powder in Chang, even though Chang does not specifically describe any niobium examples, and Chang does not describe any niobium characteristics, and only makes a passing reference to niobium powder having similar chemical and physical properties. As stated

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above, Chang does not state that electrical characteristics are interchangeable with the two powders, nor does WO '248. Therefore, the Examiner's proposed substitution of electrical properties is not supported in any of the cited art relied upon by the Examiner.

Moreover, Chang specifically describes powders below $0.6 \text{ m}^2/\text{g}$ for purposes of all of the information set forth in Chang. Even if the Examiner's proposed substitution argument is acceptable, which the applicants respectfully disagree with, Chang presents this information with respect to low surface area tantalum powder, namely below $0.6 \text{ m}^2/\text{g}$. It is respectfully noted that the BET surface area of the powder set forth in WO '248 ranges from 1.5 to $10 \text{ m}^2/\text{g}$ and most preferably 3 to $6 \text{ m}^2/\text{g}$, a difference in size of almost 300% compared to Chang. Therefore, the powder described in Chang, even with respect to the tantalum in WO '248, at least with respect to surface area, is completely different.

One skilled in niobium powder would not look to the alleged high capacitance tantalum powder set forth in WO '248 to develop niobium powders. As shown in the Declaration evidence submitted with this response, as well as the previous evidence, the type of powder set forth in Chang simply would not achieve the capacitance set forth in the present claims.

Accordingly, for the reasons presented previously of record, and set forth herein, this rejection should be withdrawn.

CONCLUSION

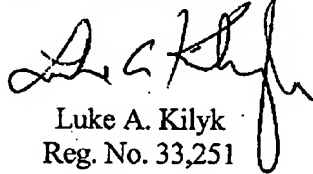
In view of the foregoing remarks, the applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37

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C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to
said Deposit Account.

Respectfully submitted,



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Atty. Docket No. 99066CON2 (3600-198-02)

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Attachment: Declaration of Jonathon L. Kimmel dated May 21, 2001 (18 pages)
Declaration under 37 C.F.R. § 1.132 (5 pages)